TMF

July 1989

THE MAC FLYER - For Greater Safety in MAC Air Operations

TWENTY-THIRD AIR FORCE

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Gen. Duane H. Cassidy — Commander in Chief
Brig. Gen. James L. Cole — Inspector General
Col. Thomas M. James — Director of Safety

Maj. Thomas C. Weinzierl — Supervising Editor
Maj. Dale E. Van De Ven — Associate Editor
Maj. Stephen E. Behr — Associate Editor
Mrs. Frances A. Caldwell — Writer/Editor
Mr. Tommy F. O'Laughlin — Art Director

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Front and Back Cover: Original artwork by Tommy O'Laughlin

WINNERS

1989 MAC FLIGHT SAFETY WRITING CONTEST

First Place

"The Lone Eagle"
By Capt. Donald R. Dillman
183 MAS (ANG)
Jackson, Mississippi

Second Place

"No Man's Land and the Max Effort Takeoff"
By Maj. Douglas W. Houpt
&
MSgt. John R. Latham
17 TAS
Elmendorf AFB, Alaska

Third Place

"Into the Abyss"
By Capt. Philip A. Bossert, Jr.
18 MAS
McGuire AFB, New Jersey

HONORABLE MENTION WINNERS

"More Than Just A Cause for Concern"
By Maj. Stephens F. McCauley
HQ MAC/XPQS
Scott AFB, Illinois

"The Ups and Downs of a C-5 Flight"
By Maj. Terry Mast
HQ MAC/DOTS
Scott AFB, Illinois

"A Victim of Circumstance"
By TSgt. Elmer R. Leonhardt
118 MSS (ANG)
Nashville, Tennessee

"Just Another Low-Level Mission"
By TSgt. James W. McClain
1275 TEF
Edwards AFB, California

"You Know What Assume Means, Don't You?"
By Maj. Gary L. Jackson
Det 3, 625 MASG
Hellenikon AB, Greece

"Crumblings"
By MSgt. Clyde H. Beal
130 TAG (ANG)
Charleston, West Virginia

"Countdown to Catastrophe"
By MSgt. Curtis L. Connor
443 TCHTS
Altus AFB, Oklahoma

"Looking Back"
By Lt. Col. J. Norman Komich
102 ARRS (ANG)
Suffolk County, New York

"Christine"
By MSgt. Bruce F. Hanke
163 TFG (ANG)
March AFB, California

SPECIAL CATEGORY WINNERS

"The Score"
By Mr. James B. Zazas
Carthage, North Carolina

"Believe it Brother, Believe It!"
By Maj. Grover C. Tate, Jr. USAF (Ret)
Joshua, Texas

The Lone Eagle

Only one star in the cockpit, or so he thought.

By Capt. Donald. R. Dillman
183 MAS (ANG), Jackson, Miss.

Capt. Pete Lawson knew he could handle it. They were diverting to Carswell to pick up a premature baby. It reminded him of when he and his wife nearly lost their first child when it was only a few months old. In fact they would have lost her had the ambulance not responded to their frantic middle-of-the-night call so rapidly. Pete was determined to do the same by converting his C-141 into an airborne ambulance, thus preventing another family's grief. As it always seems to happen, the diversion wouldn't be as simple as originally planned. While descending, a grey cauliflower-shaped thunderstorm growing in the night skies of north Texas, had appeared on the Carswell radar about ten minutes earlier. It hadn't produced any rain on the field yet, even though it was located on final just to the east of the localizer. So far the flight had gone smoothly and the crew enjoyed some light conversation while descending. This would be the first time any of them had been into the Texas base. Pete was going over the instrument approach in his mind. He was also going over some of the Dash One considerations for both weather approach and ensuing medical evacuation flight. He knew he didn't have a choice but to fly the approach as soon as possible.

Pete handled the airplane smoothly and confidently but was still maturing as an aircraft commander. He easily convinced people to follow him by using his natural popularity. When that wasn't enough, Pete's intense gun-

1989 MAC FLIGHT SAFETY WRITING CONTEST FIRST PLACE

metal-grey eyes quickly turned from warm lights of compassion to cold tools of persuasion. Pete was very clear on one point—there was only one star in this movie, the pilot. Everyone else had a supporting role. Pete knew the rest of the crew had jobs to do but he also knew, when you got right down to it, nothing really mattered except what happened in the left seat.

"MAC 195, descend to cross the Acton VOR at and maintain 5,000 feet. Carswell altimeter 29.61. Contact regional approach now on 125.8."

The copilot acknowledged the clearance, changed radio frequencies and continued with his study of the approach plate. Pete looked at him in the darkened cockpit. He was doing a great job keeping up with the cockpit workload. What Pete couldn't see though was the great job he was doing hiding his growing uneasiness. He had only checked out in the C-141 a few months ago. Along with the rest of the crew, he was listening to a busy approach controller handle a deteriorating situation. The calm voices on the frequency camouflaged the underlying strain in each of the cockpits.

"MAC 195, Carswell weather is 600 overcast, winds 170 at 5 and the altimeter 29.61."

"Pete, I don't think we should try Carswell right now, that cell's too near the final."

"Engineer agrees Capt'n. . . We have enough gas to hold for about 30 minutes and still divert to our alternate." The engineer had gone into the performance charts when he saw the worsening weather.

"We'll be on the ground in under ten minutes and I don't think there's a problem with that storm right now anyway," said Pete.

"It's not raining yet, the winds are still pretty mild, and that baby needs to get to Brooks Medical if she is going to have any chance of surviving. Plus, as you point out we have the extra gas to take a look. If we can land, we will; if we can't, then we'll hold or divert at that time. Besides it's my approach, and I know how to handle it."

The discussion ended there. The crew knew they weren't going to change his mind. Besides, they each told themselves, he's probably right. Just get the airplane on the ground.

On final, the ride was much smoother than any of them had expected. The rain started just a few minutes before they started the approach.

"Carswell final controller, MAC 195 . . . descending to three thousand . . . the ride's real smooth out here, just some rain."

"Roger MAC 195. Carswell wind 150 variable 180 at 5 knots. Cleared to land."

"MAC 195 cleared to land."

I knew this wouldn't be that big of a deal, Pete thought. These guys just need to have a little confidence in me . . . .

"The groundspeed is about 10 knots slow but it's moving around quite a bit." The copilot knew they would get through this all right. All the stories about Pete said he was one of the best sticks in the squadron.

Pete was doing a good job of flying the localizer and glideslope. The rain increased suddenly and with it came an increasingly rough flight.

"There is some lightning."

"Where?"

The buffeting increased quickly. The copilot was starting to perspire, he felt as if the cockpit was burning up. He would mention it to the engineer when they got on the ground. The airspeed fluctuated while all crewmembers instinctively tightened their seatbelts. Each wondered what they were getting into. The sink rate was increasing to over 1,500 feet per minute. Pete instinctively pushed up the power.

"Right over there."

"I don't see it." Pete didn't take his eyes off the instruments now.

"Over there!" He didn't look up, he couldn't.

"C'mon baby, don't fight me now." He kept a relaxed grip on the yoke and tried vainly to move the throttles in response to the changing conditions. Pete depended on his natural skill. It would get him through this just like it always did.

The airspeed bled off, the sink rate increased, and the higher power setting was not stopping the decay.

"Just a little bit further, I know we're going to break out any second."

Then the big push hit. It felt as if they had been catapulted off the edge of a cliff. The sinking feeling was frightening. Pete pushed up the power but not all the way; he wasn't to his limits

"Besides it's my approach, and I know how to handle it."

yet, he couldn't be. He never had been before. He knew the situation would turn out just like all the rest had before.

The copilot called out airspeed, sink rate, and radar altitude. He was unaware anything else was going on. His vision had narrowed to the point that he didn't even realize the Ground Proximity Warning was screaming its alarm in the headset or that its brilliant red "PULLUP" light was flashing just a few inches in front of his face. He knew they were going to hit the ground and didn't know what to do. He watched helplessly as the airspeed plummeted crazily.

"500 feet . . . 400 feet . . . sinking 2,000 . . . 110 knots . . . 15 degrees nose up . . . ."

He was having difficulty focusing on the instruments. They seemed to be moving faster and faster.

"Go to the stops, pilot." The engineer yelled motioning at the throttles. "We're not going to go down without a fight."

The turbulence made it feel as if they were the ball in a huge airborne tennis match. The airplane was viciously buffeted from side to side.

The engineer strained so hard the shoulder straps bit into his arms as he reached forward for the throttles. The only thing heavier than the controls in the pilot's hands was the tension in the air.

The -141 clawed at the air like a trapped animal snared in an invisible net—its nose raised skyward desperately trying to break its bonds. Its engines screamed as if sheer noise could overcome the inevitability of impact.

"300 feet . . . 105 knots . . . sinking 1,500 . . ."

Suddenly the powerful airplane was spit out the bottom of the churning cloud and all eyes searched for the ground.

"100 feet . . . fifteen degrees nose up . . . 120 knots . . . no sink. . . ."

"There's the runway . . . straight ahead . . . my God . . . we're going to make it . . . We're going to make it!" The copilot beat the glareshield with his fist in nervous excitement. His eyes were moist.

The aircraft was flying at a rakish angle but Pete knew he could make the runway. They had exited out the back side of the microburst and were in relatively calm surroundings. He kept the power at maximum to overcome the downward momentum they exited the storm with. They touched down hard on the rain-soaked runway but no one on the crew spoke up to mention it. They had seen the face of death; the look and feel would stay with them forever.

The silence seemed like an eternity. Pete released the yoke from his sweaty hands. He looked down at his flight suit; it was soaked from the waist up. His heart was pounding rapidly. His head was throbbing. My God, what happened? He thought it was only going to be a little turbulence on the approach.

Pete looked at the copilot who was reliving the vividness of the approach in his mind. The engineer was fiddling with a ballpoint pen, trying to figure out what had just happened.

A bright piercing white light suddenly penetrated the cockpit.

"Well, I have to give it to you, Pete, even though I'm sure you collapsed the landing gear, you at least made the runway. Most people who try that approach die somewhere out on final."

Pete looked around slowly at the blue-uniformed captain sitting in the simulator jumpseat. ✈

Capt. Donald R. Dillman is a 1978 USAF Academy Graduate with an extensive background in C-141s. He joined the ANG in 1987 where he currently is a C-141 instructor. When wearing his "civilian" hat Captain Dillman is a First Officer flying with American Airlines.

Global Notes

As happens all too often, it's time to say goodbye to another *TMF* staffer. Major Thomas C. Weinzierl, *TMF* Supervising Editor, departs this month to return to the operational MAC world and the C-5. Major Weinzierl saw *TMF* through several threatened cancellations and other near calamities to see the magazine emerge in a glossy new format and stronger than ever. But, as he says, "It's time to quit writing about flying and go do some!" So long, Boss!

Replacing Major Weinzierl, *TMF* welcomes Lt. Col. Richard L. Buck from duty as Commander, C-130 Technical Assistance Field Team, Riyadh, Saudi Arabia. Colonel Buck has extensive C-130 tactical airlift experience, having flown the Herk at Clark AB, Republic of the Philippines, and Little Rock AFB, Arkansas. No stranger to Scott or the MAC staff, Colonel Buck previously worked as C-130 Flight Examiner in MAC/DOV. Welcome aboard, Sir!

Twenty-Third Air Force

By Maj. Steve Behr
Associate Editor

Over the last twelve months *TMF* has visited both Twenty-First and Twenty-Second Air Forces and their CONUS-based airlift wings. Now it's time to visit bases and personnel who are the backbone of Twenty-Third Air Force. We begin our tour with a visit to the headquarters at Hurlburt Field, located on the "Emerald Coast" of Florida; it's a tough job, but someone has to do it. I arrived under cover of darkness; how else can you report on special ops?

Twenty-Third Air Force serves a dual role as one of MAC's three numbered air forces, and as Headquarters Air Force Special Operations Command (AFSOC), one of three service components of United States Special Operations Command. Having a twofold mission for the headquarters is just the beginning of what makes 23 AF distinct from other NAFs.

Just finding the headquarters entry could be a challenge to a first-time visitor. In keeping with the special forces tactic of diversion, 23 AF's entrance isn't at the front of their building, it's over to one side.

My first stop was with Lt. Col. Lloyd H. Hinze, Deputy Director of Safety; Lt. Col. Stuart B. "Stu" Foote, Chief of Flight Safety, my host for the visit, and Capt. Harold L. "Max" Maxwell, Flight Safety Officer. I know them all from my last assignment. Colonel Foote related that the challenges for the flight safety staff are many. Having 17 weapon systems to keep up with and a two-person flight safety office is a good place to start. While the flight safety staff at 21st or 22d have flown the major weapon systems (C-5, C-130, or C-141) the staff at 23 AF depends on experts in the headquarters when dealing with detailed aircraft systems. Colonel Foote flies the C-21A with Det 4, 1402 MAS, Eglin AFB, Fla., he's also flown HH-53s, MH-53s, and T-38s. Captain Maxwell flies H-3s with 102 ARRS (ANG), Suffolk County Aprt, N.Y., with previous experience in H-53s and H-60s. According to Colonel Foote, "Helicopters present the biggest challenge. We ask them to do a lot

MISSION

Twenty-Third Air Force (23 AF), with headquarters at Hurlburt Field, Fla., concurrently serves as one of MAC's three numbered air forces and one of three service elements of the unified U.S. Special Operations Command. Twenty-Third Air Force has no geographical limits and functions round-the-clock in all environments. The command's 139 elements are stationed at 52 separate locations, with a total of 14,800 folks. The 337 aircraft currently assigned include: H-1, H-3, H-53, and H-60 helicopters; and C-130, AC-130, HC-130, MC-130, WC-130, WC-135, C-9, C-140, CASA-212, C-12, C-21, and T-39 fixed wing aircraft.

The primary 23 AF mission is U.S. Air Force special operations. Other important missions are special operations training, combat rescue operations and training, aeromedical evacuation, operational support airlift, SAC missile site support, atmospheric sampling, weather reconnaissance, space shuttle contingency rescue support, facility flight checking, and peacetime search and rescue operations and coordination.

Seven wings are currently assigned to 23 AF: 1st Special Operations Wing, Hurlburt Field, Fla., 39th Special Operations Wing, Rhein-Main AB, Germany; 41st Rescue and Weather Reconnaissance Wing, McClellan AFB, Calif., 353d Special Operations Wing, Clark AB, RPI; 375th Aeromedical Airlift Wing, Scott AFB, Ill., 1550th Combat Crew Training Wing, Kirtland AFB, N.M., and 1606th Air Base Wing, Kirtland AFB, N.M.

Other principal units are: Aerospace Rescue and Recovery Service (will become Air Rescue Service, reporting directly to Hq MAC, 1 August 1989), Scott AFB, Ill., USAF Medical Center, Scott AFB, Ill., USAF Special Operations School, Hurlburt Field, Fla., and 1720th Special Tactics Group, Hurlburt Field, Fla.

HISTORY

Special operations activities of the Army Air Forces during World War II were directed through the Office of Strategic Services in Europe and consisted mostly of infiltration and exfiltration of covert forces and supply and resupply of resistance groups. In the China-Burma-India Theater, the 1st Air Commando Group helped airdrop, airland, and resupply British troops behind Japanese lines in Burma.

During the Korean War, the Air Force activated several Air Resupply and Communications Wings to provide special operations capabilities in the Pacific Theater.

Another revival of special operations activities took place during the war in Southeast Asia. In March 1961, during the Kennedy Administration, the 4400th Combat Crew Training Squadron of TAC was established at Eglin AFB, Fla., beginning a gradual buildup of Air Force special operations forces.

The Air Force Special Warfare Center was established at Eglin AFB in 1962. This organization was redesignated U.S. Air Force Special Forces in 1968 and deactivated 1 July 1974.

Twenty-Third Air Force was established at Scott AFB, Ill., 1 March 1983, combining Air Force special operations units and Air Force combat rescue units under one command. During the next two years, other units and missions were assigned. Following the establishment of U.S. Special Operations Command 16 April 1987, at MacDill AFB, Fla., 23 AF moved to Hurlburt Field 1 August 1987. In July 1987, Headquarters 23 AF also assumed the informal designation Headquarters Air Force Special Operations Command.

After undergoing reductions in forces during 1986 and 1987, 23 AF began activating new special operations units in 1988. In the future, 23 AF and AFSOC will continue to expand special operations activities.

Near the entry to 23 AF.

Col. John Tatom, Director of Safety.

more than other weapon systems and we want them to be very precise in doing it."

My next stop was with Col. John K. Tatom, Director of Safety. Colonel Tatom stated that "One challenge to flight safety in 23 AF is increasing mission demands while crew experience levels decrease." Colonel Tatom was quick to point out that, "Our commanders really provide the strength and guidance to complete the mission safely. Flight safety and successful mission accomplishment are getting a big help with some of the SOF improvements. Bringing on new aircraft and improving systems integration will keep 23 AF ready to go to war safely, with minimum losses."

No trip to a numbered air force is complete without going to see the "big picture" in the operations center. At 23 AF there's no large map on the wall showing channel routes or missions in progress; here there are displays connected to the Global Decision Support System (GDSS), large communications consoles, and three small maps. Maj. George N. Stokes, Jr. took me on a guided tour of the facility; he was very enthusiastic about GDSS and its capabilities. With flying units located in three theaters

Capt. Harold "Max" Maxwell checking message traffic.

Lt.Col. Lloyd Hinze writing the next 23 AF Mishap Review.

of operation, the staff is busy 24 hours per day with mission tracking. The closest 23 AF comes to scheduled channel missions are airevacs flown by 375th Aeromedical Airlift Wing crews; even those missions have variable routes. A typical day's schedule includes 48 OSA missions, 12 airevacs, 2 flight inspections, 35 AC/HC/WC/MC-130 missions, and 47 helicopter taskings.

Next stop during the visit was with Col. Ronald L. Jones, Director of Operations. Colonel Jones began by stating, "The special operations mission's regimes are inherently dangerous. Safety is an attitude, it can't be legislated or put in regulation. Our people in special ops are very safety conscious—they operate in a regime where a small mistake can have disastrous results."

He continued, "Our goal is to give crews the best equipment and training to get the best results. Simulators are becoming a very important part of providing training to our crews, who have had to use aircraft for procedures trainers in the past. Another benefit of simulators will be mission rehearsal, it will let us see threats, help in planning, and improve mission success. Twenty-Third Air Force units are spread out all over the globe. Two new wings, the 39 SOW at Rhein-Main and 353 SOW at Clark, will help improve communications within each theater and between our units and supported commands. Improvements in mission training, systems reliability, mission planning, and mission rehearsal will lead to successful special ops missions."

I also stopped at the plans and programs shop to see what mods and changes were in progress for SOF aircraft. I spoke to Maj. Steve D. Saarela who handles MH-53s, sometimes called PAVE LOW III, a heavy-lift, night, adverse weather-capable helicopter. Many modifications are directed at better reliability, increasing ease of computer interfaces, and making AF SOF systems compatible with other SOF forces. All totaled, there are 43 modifications planned during the PAVE LOW III enhancement program, including several safety mods, such as crashworthy seats and crashworthy external fuel tanks. Also included in the improvements will be ring laser gyro inertial navigation systems, making possible pinpoint insertion of special forces teams.

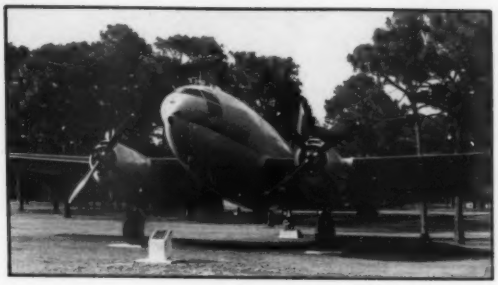
Helicopters aren't the only SOF aircraft to get modifications. Maj. Bryan L. Lillegard explained that HC-130P/N tankers, some C-141s, and C-130s are going to receive some SOF improvements as well. Mods for the C-141s and C-130s will upgrade a few aircraft to SOLL II configurations; most of the improvements will make these airlifters compatible with other SOF aircraft. For the HC-130s the improvements will mean improved tactical capability, flexibility, and OPSEC. Internal and external NVG compatible lighting will be going onto all three weapon systems, as will FLIRs and HUDs compatible with NVGs.

My final stop was with Brig. Gen. Hanson L. Scott, Vice Commander. General Scott started by saying "Flight safety starts with a strong training program, is enhanced by standardization programs, and then the credibility of our flight safety program." The general continued, "In 23d, safety guidance from the top is for unit commanders to be involved in mission planning. Special ops, by nature of its mission requires precise planning; a good safety record is a result of good planning." When asked which mission in 23 AF was most challenging, the general replied, "Most demanding—PAVE LOW, but all are demanding in different ways; AC-130s may not have as much low-level exposure; but they have other challenges, MC-130s making airdrops at 250 knots and 250 feet AGL at night is tough, and the HC-130 mission proves you can fly difficult missions safely with dedicated and professional aircrews."

With establishment of 23 AF in 1983, MAC became increasingly involved in special operations. This involvement includes not only dedicated SOF assets, but all elements of the MAC airlift system in support of unconventional warfare activities. There are no military airlift wings or tactical airlift wings in 23 AF, but there is airlift here, special airlift.

All great trips have to end and mine to Twenty-Third Air Force was no exception. I'm very grateful to the folks at 23 AF Safety for their fine southern hospitality, their help in arranging interviews and gathering information for this article.

Special operations aircraft museum.



Take Heed

It might be your last chance.

"Thank you, Captain Riley," Capt. Brad "Mac" MacKenzie said as he stepped onto the podium and took his place behind the lectern to address the wing flight safety meeting. "As Jack said, I was the investigating officer for the mishap he mentioned. He told me you're all aware of the location and other details, so I'm just going to go into what happened. Unfortunately, this mishap falls into the 'human factors' category, and we lost some very fine people due to several human errors. This is not meant to be a strictly formal briefing, so if anyone has a question at any time, just speak up.

"The crew was executing a nonprecision approach in night IMC. After passing the FAF, the pilot began descent to MDA of 380 feet MSL, which was 345 feet AGL. The descent rate began increasing at about 900 feet AGL. This was about the same time the pilot said 'Groundspeed's a little low, I'm going to keep my speed up.' He didn't add any power. At this point it appears there was a breakdown in basic instrument procedures and instrument crosschecks. The aircraft's pitch attitude increased through 10 degrees nose down to 14 degrees nose down. Descent rate increased to over 2,800 feet per minute about 8 seconds before impact. The instrument crosscheck breakdown was probably caused by channelized attention on the airspeed indicator or the weather. The copilot was also evidently not performing an adequate crosscheck as he failed to note the excessive descent rate. He may have directed his attention to the airspeed indicator or the weather radar, which should have been depicting a thunderstorm over the airfield, or outside the aircraft looking for ground references. The person in the jumpseat made several references to thunderstorm activity and was also probably focusing on the weather radar scope.

"The aircrew was then distracted by a GPWS warning at that time. Thirteen seconds before impact, at an altitude of approximately 640 feet AGL, the GPWS presented an aural 'Whoop Whoop, Pull Up' and a visual red 'Pull Up' warning. Both pilots' attention was directed to this warning. At approximately 550 feet AGL, the AC stated 'Acknowledged crew, good configuration.' The warning continued until the copilot stated 'Inhibit Mode 4' at about 260 feet AGL. The airplane hit the ground 5 seconds later. During those 8 seconds the GPWS warning sounded, the airplane descended through MDA. Descending through an MDA illuminates a yellow warning light in front of both pilot and copilot. However, they probably didn't observe this light due to the red, larger, and relatively brighter GPWS light commanding their attention.

"Once their instrument crosscheck broke down and the high descent rate initiated, it's possible the aircrew was subject to spatial disorientation. Air Force physiologists calculated that a somatogravic illusion may have caused the pilot to put the airplane into an excessive nose down pitch attitude. A somatogravic illusion may occur when forward acceleration results in a falsely perceived tilt of one's body with respect to the vertical. This may result in a greater descent rate and altitude loss than the pilot perceives. It's possible a G-excess or 'elevator' illusion occured during the last 5 seconds of flight. This illusion results from the increase in G-forces occurring during level off or decrease in descent rate. A pilot will compensate by pitching down, although in this instance he had started a gradual pull-up before

impact. The net effect of the two illusions was the pilot estimated the airplane was at or near MDA when it was in fact near the surface. So, as you can see, when you combine loss of instrument crosscheck, distraction, channelized attention, and spatial disorientation, you're bound to lose all situational awareness. A mishap is almost inevitable."

"Excuse me sir. Lieutenant Ferguson. Weren't there any altitude calls made by the copilot?"

"No, Lieutenant. None of the crewmembers expressed concern over the rapid descent at such a low altitude. As I said, the GPWS sounded its warning 13 seconds before impact. The pilot checked airplane configuration and the copilot subsequently pressed the GPWS inhibit switch. During the 8 seconds the GPWS sounded, the airplane descended below MDA. There were no advisory '100 above' or 'minimums' calls by the copilot. Trajectory data indicated had level off been started at 306 feet AGL, there would have been sufficient time to provide terrain clearance. So, and this is a very important point for the pilot not flying the approach to always remember—*advisory calls can prevent mishaps.*"

"Another question, Captain, Lieutenant Colonel Mitchell. Why didn't the GPWS warning have any effect? Did they just think it was a false warning, or did they misinterpret what it was trying to tell them?"

"When the warning sounded, the pilot responded by checking his configuration and stating, 'Acknowledge crew, good configuration.' So he keyed in on just one of the GPWS warning parameters, that of an unsafe configuration below 500 feet, rather than an excessive sink rate.

"There are six modes that provide warnings on this type of GPWS. Mode 1 warns of an excessive descent rate in relation to altitude. Mode 2A warns of an excessive closure rate to terrain while not in landing configuration. Mode 2B warns of excessive closure to terrain in landing configuration. Mode 3B warns of excessive altitude loss before acquiring 700 feet clearance. This is for takeoffs and go-arounds. Mode 4, which this pilot was concerned with, warns of unsafe configuration below 500 feet. And Mode 5 warns of glide slope deviation.

"The pilot may have reacted to the GPWS warning from a 'perceptual set.' That is, the expectation that when the GPWS goes off on an approach, it's a Mode 4 warning. Again, loss of situational awareness may have caused the pilot to key in on just one warning mode, and it wasn't the right one.

"There are a couple of other aspects of this GPWS problem we can all learn from. We found the copilot's GPWS control panel. The instrument investigator determined the GPWS inhibit switch was illuminated at impact, but the GPWS Mode 4 was not. It's possible the close proximity and strong similarity of the Mode 4 and GPWS inhibit switches resulted in the copilot actuating the wrong switch. This resulted in the mode that caused the warning, Mode 1, which warned of the barometric altitude sink rate, to be inhibited.

"If the copilot intended to actuate the GPWS inhibit switch, it shows a lack of confidence in the reliability of the GPWS warning. The crew spent critical time evaluating the warning's validity rather than taking evasive action. Lack of aircrew confidence in the system may have been a result of their experience with nuisance warnings. Nuisance warnings occur when mission profiles require the airplane be flown within the envelope of one of the GPWS modes, for instance, low level air drop missions and CAT. This approach certainly wasn't in either of those categories.

"Our survey found younger pilots tend to have a higher level of confidence in the system. For example, copilots are more go-around oriented on GPWS warnings than aircraft commanders, instructor pilots, or flight examiners. In addition, we found considerable confusion about operation of specific modes, and inhibiting Mode 4, or the overall system. There was also an expectation of nuisance warnings. So more experienced pilots had less faith in the system. Why? Maybe they had more faith in their abilities than in a black box. But the pilot in this mishap was an IP and the copilot had recently requalified in the airplane. He'd previously been an aircraft commander. *Two experienced pilots flew the airplane into the ground.*

"You have to have faith in the GPWS. When it sounds off, it's trying to tell you something—most likely that you screwed up and it's giving you one last chance to save your rear end. I know *I've* never had a perfect flight or mission. There was always something I could have done faster, sooner, or more precisely. *When that thing goes off, do something.* Take some positive action. There was no reason these guys couldn't have gone around. The GPWS is a backup system, and will most likely warn you only when something is wrong.

"That's all I have except for one final question for you. Is there anyone who thinks the same thing couldn't happen to him or her?" ✈

Day or night . . .

Flying CAT Safely

By Capt. James Taiclet
86 MAS, Travis AFB, Calif.

(Editor's Comments: Information in this article is current as of May 1989. Changes, if any, will be announced by HQ MAC/DOV.)

On 1 January 1989, MAC Headquarters implemented a new Combat Aircrew Training (CAT) Program. Each active duty C-5 and C-141 wing must conduct low-level training for its crews including threat analysis and combat mission planning. The goal of this new CAT program is to give our strategic airlift crews the ability to accomplish airland missions that penetrate potential threat environments. The immediate challenge, however, is for all our wings to plan and fly CAT *safely*. This article provides techniques for safely conducting low-level training in CONUS airspace. Procedures for low-level VFR operations are contained in the applicable 55-series regulations, AFR 60-16, and FLIP AP 1/8.

A safe and successful CAT mission begins in the planning room. A thorough plan is essential in the unfamiliar environment in which the crew will be operating. The two greatest dangers in the low-level regime are collision with the ground and collision with other aircraft. With thorough research and planning, the crew can minimize these dangers.

Pilots are responsible for appropriate chart selection and en route preparation. The Joint Operations Graphic (JOG) is 1:250,000 scale and provides excellent topographic detail for VFR navigation. On the other hand, the Tactical Pilotage Chart (TPC) uses the 1:500,000 scale, and provides more of a "big picture" view of the route, but somewhat less detail. Each chart must be revised and updated monthly with information in the Chart Updating Manual (CHUM). Any changes to the chart occurring within 22 nm of course must be annotated to ensure your plan's accuracy.

Aircrew members, using FLIP AP 1/B for route data, should work independently under the supervision of an instructor pilot and compare courses, altitudes, etc. they have determined. Meanwhile, other crewmembers should prepare a chart of their own. All crewmembers need to understand the route in order to assist in outside vigilance and to

back up pilots' inflight navigation.

Each crewmember must be aware of two very important items—the Emergency Safe Altitude (ESA) and Minimum Safe Altitude (MSA) for each route segment. The ESA is prescribed in MACR 55-141, Chapter 21, as 1,000 feet (2,000 feet in mountainous terrain) above the highest obstacle within 22 nm of the route of flight. The MSA, during day modified contour flight, is calculated by adding the planned AGL flight altitude (usually 500 feet or 1,000 feet) to the highest obstruction within 5 nm of route centerline for that leg. These altitudes will be used to ensure terrain clearance during various emergency situations described later.

Another essential crew planning consideration is route deconfliction. A number of steps are required to reduce your chances of attempting to occupy the same airspace as another military or civilian aircraft. The first step is to obtain a Sectional Aeronautical Chart published by the National Oceanic and Atmospheric Administration. These charts provide a wealth of information to help ensure safe VFR flying. Sectionals are the only convenient source of information on Terminal Control Areas (TCAs), Airport Radar Service Areas (ARSAs), Terminal Radar Service Areas (TRSAs), and Airport Traffic Areas. All these high density air traffic regions should either be avoided or researched to determine what operational and communication requirements they have that apply to VFR aircraft. It may be advisable to pick up an IFR clearance if you must transit any of these areas either to or from your low-level route.

Other places with high collision potential are Military Operating Areas (MOAs), Special Use Airspace such as Restricted Areas, and of course other Military Training Routes. The Sectional Chart shows MOAs and Special Use Airspace and also lists their effective times and controlling agencies. The safest course is simply to avoid these areas. But, if there is a requirement to penetrate them, contact the controlling agency to ensure they won't be "hot." Conflicting Military Training Routes can be found using two main sources. Overview charts provided in FLIP AP l/B show all MTRs and where they intersect. Sectional charts provide a more detailed account of where IFR military training (IR) and VFR military training (VR) routes will cross your path. However, they do not depict slow speed low altitude training (SR) routes (which the C-5 and C-141 will normally be using). Whenever any type of MTR intersects your route, the aircraft commander must contact the controlling agency listed in AP 1/B to ensure that other aircraft won't be flying on conflicting routes at the same time.

"Each crewmember must be aware of two very important items— "

A final step in the planning process is to annotate your VFR chart with all applicable deconfliction information and also with course and distance data to suitable emergency airfields near your route. Be sure to indicate where other MTRs cross your flight path and delineate any civil or military airspace you need to avoid. This completes the planning phase, but the focus on safety must continue as you execute your mission plan. Both major threats, potential collision with the ground and the possibility of a midair, demand constant attention during the low-level portion of the flight.

Avoiding the ground is more difficult than one might think in the tactical environment. Task saturation in this unfamiliar realm is a definite factor for new CAT crews. Fighter pilots use the term "comfort level" regarding low-level operations. When things are happening too fast and the situation just plain doesn't feel right, you are exceeding your comfort level. If this occurs, it's time to climb—get away from the ground and sort everything out. Careful planning and astute instructor assessment of the crew's capabilities are key to avoiding unsafe situations due to task saturation. Remember, once you've exceeded your comfort level, climb. Don't push the limits; this is a training program, so err on the safe side.

Moreover, being qualified to fly at 500 feet AGL modified contour during the day doesn't mean you have to constantly be at 500 feet. The objective here is threat avoidance through terrain masking. If you are flying in rough, high terrain, 1,000 feet or even higher may be sufficient for effective terrain masking. So, don't be at 500 feet if you don't necessarily need to be if it exceeds your comfort level.

One of the challenges to effective low-level flying is ridge

crossing. A useful technique for judging climbs over ridgelines is to have the copilot state the elevation of the top of the ridge well before you cross it. Begin your climb to be at the ridge altitude plus your planned terrain clearance (ie. 500 or 1,000 feet) *before* you reach the ridge crossing point. Another important consideration is valley flying. Position the aircraft on the upwind side of the valley and about two-thirds of the way up the parallel ridgeline. Do not fly at minimum altitude down the middle of the valley floor. This can lead to trouble if you encounter a box canyon where you can't make the climb gradient straight ahead because you're too low in the valley. Furthermore, you can't turn around because you're smack in the middle of the valley with rising terrain on both sides. Conversely, if you fly the "military crest" described above, you should be able to climb *or* turn around to get out of a box canyon situation.

In the low-level regime, avoiding other aircraft requires just as much attention as avoiding the ground. All crewmembers not involved in other duties should assist in outside vigilance. Military training routes are published and scheduled for use, but uncontrolled civilian VFR traffic and unscheduled military aircraft are always a threat. During low-level, the pilot will be busy with terrain avoidance, while the copilot will be involved mostly with map reading. Therefore, other crewmembers, especially the jump seat occupant, *must* clear. Use your radio to help avoid potential midair collisions. Be sure to contact Flight Service (UHF 255.4) with your route number, entry time, and entry point. While on the route, monitor flight service, airport towers, UNICOM and air traffic control frequencies for info on nearby traffic.

Another novel aspect of the new CAT program is the night low-level mission. During night operations, the route is flown on centerline at the minimum safe altitude for each segment. Meticulous planning and close attention to the CHUM are the foundations of safe night low-levels. Strictly follow two rules to avoid getting too low near turnpoints where the segmented altitudes change. First, if the next segment altitude is higher, climb to that altitude *before* reaching the turnpoint. In addition, night operations demand absolute adherence to centerline. Before departure, ensure that the data in the INS is correct. If, while en route, you get more than five miles off course, your segment altitude no longer guarantees terrain clearance.

This brings us to the final topic of discussion concerning safe low-level flying — handling emergency situations. Two of the most hazardous occurrences in this environment are inadvertent weather penetration and position disorientation (especially at night). Remember, while on low-level routes, MAC strategic airland crews operate under VFR with cloud clearances specified in AFR 60-16. Don't test the limits—if the weather is deteriorating follow appropriate procedures. Either alter your route to remain VMC, remain VFR and file an IFR flight plan, or remain VFR and land. In any case, abort the low-level route and do not attempt to return to it.

If you do actually encounter IMC on the low-level route, you must immediately climb to at least emergency safe altitude. Also accomplish this procedure if you become disoriented and believe you may be greater than 5 nm off course (day or night). An effective technique is to set MRT for climb power. Have the IFR low chart available with the local ARTCC frequency and nearest TACAN station set in to facilitate picking up an IFR clearance, if remaining in IMC. If necessary, use guard frequency and squawk emergency to alert air traffic control to your situation.

Of course, things can still go wrong with the airplane on a low-level route. Losing an engine is a real possibility, especially in view of the increased birdstrike potential in the low altitude regime. MACR 55-141 procedure states that if any malfunction occurs requiring the pilot's attention, immediately climb to at least minimum safe altitude. Again, setting MRT for climb is a good technique. If the problem requires a route abort, coordinate for an IFR clearance or proceed VFR to your home base or emergency airfield, as appropriate. In addition, climb to MSA should be initiated if the crew becomes position-disoriented (within 5 nm of course) or if one pilot must leave his seat for any reason.

Headquarters MAC has determined that our C-5 and C-141 airland crews should embark on a serious Combat Aircrew Training Program. It's our responsibility in the wings and squadrons to conduct this training effectively and, above all, safely. A safe CAT mission begins in the planning room. The crew must understand the terrain characteristics they will be flying in and, just as important, they must analyze the heightened threat of midair collision. Furthermore, emergency situations take on a whole new dimension at 500-feet AGL and 230 KCAS. Our crews must be prepared to handle any problem before it occurs.

Hopefully, some of the concepts and techniques described in this article will help MAC's CAT instructors and crews conduct a safe and successful training program. ★

TMF ROLL O

As of 30 September 1

MAC UNIT MISHAP-FREE FLYING-HOUR MILESTONE AWARD

800,000 HOURS
76 MAS

650,000 HOURS
1 MAS
14 MAS

600,000 HOURS
6 MAS

500,000 HOURS
4 MAS

450,000 HOURS
137 TAW (ANG)

400,000 HOURS
86 MAS
89 MAW

350,000 HOURS
53 MAS
136 TAW (ANG)

300,000 HOURS
11 AAS
1401 MAS

250,000 HOURS
9 MAS
62 MAW
403 RWRW (AFRES)
437 MAW
438 MAW
445 MAW (Assoc)
446 MAW (Assoc)
459 TAW (AFRES)
1400 MAS

200,000 HOURS
17 MAS
36 TAS
315 MAW (Assoc)

150,000 HOURS
8 MAS
18 MAS
20 MAS
21 TAS
41 TAS
50 TAS
61 TAS
345 TAS
439 MAW (AFRES)
514 MAW (Assoc)

140,000 HOURS
97 MAS (Assoc)
55 WRS

130,000 HOURS
1 HS

120,000 HOURS
1 HS
64 TAS (AFRES)
96 TAS (AFRES)
156 TAS (ANG)
183 MAS (ANG)
185 TAS (ANG)
313 MAS (Assoc)
327 TAS (AFRES)

100,000 HOURS
7 MAS
30 MAS
41 RWRW
53 WRS
73 AAS
167 TAS (ANG)
180 TAS (ANG)
187 TAS (ANG)
193 SOS (ANG)
312 MAS (Assoc)
463 TAW
772 TAS
Det 1, 1401 MAS

OF HONOR

MAC UNIT MISHAP-FREE FLYING YEAR MILESTONE AWARD

40 YEARS OR MORE

1 MAS
64 TAS (ANG)

30 YEARS THROUGH 39 YEARS

1 HS
6 MAS
14 MAS
73 AAS (Assoc)
76 MAS
96 TAS (AFRES)
156 TAS (ANG)
180 TAS (ANG)
183 MAS (ANG)
193 SOS (ANG)
305 ARRS (AFRES)
312 MAS (Assoc)
313 MAS (Assoc)
327 TAS (AFRES)

25 THROUGH 29 YEARS

9 SOS
58 MAS
63 TAS (AFRES)
97 MAS (Assoc)
130 TAS (ANG)
137 TAW (ANG)
142 TAS (ANG)
167 TAS (ANG)
185 TAS (ANG)
187 TAS (ANG)
301 ARRS (AFRES)
303 TAS (AFRES)
328 TAS (AFRES)
403 TAW (AFRES)
459 MAW (AFRES)
756 MAS (AFRES)
758 TAS (AFRES)

20 THROUGH 24 YEARS

4 MAS
36 TAS
53 MAS
53 WRS
55 WRS
55 AAS
68 MAS (AFRES)
86 MAS
94 TAW (AFRES)
115 TAS (ANG)
136 TAW (ANG)
143 TAS (ANG)
144 TAS (ANG)
164 TAS (ANG)
181 TAS (ANG)
326 MAS (Assoc)
335 MAS (Assoc)
337 TAS (AFRES)
356 TAS (AFRES)
445 MAW (Assoc)
446 MAW (Assoc)
700 TAS (AFRES)
728 MAS (Assoc)
729 MAS (Assoc)
730 MAS (Assoc)

10 THROUGH 19 YEARS

Det 1, 1 SOW
7 MAS
7 SOS
8 SOS
9 MAS
11 AAS
17 MAS
17 TAS
18 MAS
21 SOS
21 TAS
31 ARRS
Det 3, 37 ARRS
Det 5, 37 ARRS
Det 8, 37 ARRS
Det 9, 37 ARRS
Det 10, 37 ARRS
Det 24, 37 ARRS
41 TAS
50 TAS
56 MAS
61 TAS
Det 9, 67 ARRS
89 MAW
Det 1, 89 MAW
102 ARRS (ANG)
109 TAS (ANG)
133 TAW (ANG)
135 TAS (ANG)
137 MAS (ANG)
139 TAS (ANG)
155 TAS (ANG)
158 TAS (ANG)
300 MAS (Assoc)
301 MAS (Assoc)
302 SOS (AFRES)
304 ARRS (AFRES)
315 MAW (Assoc)
345 TAS
357 TAS (AFRES)
439 MAW (AFRES)
512 MAS (Assoc)
514 MAW (Assoc)
616 MAG
701 MAS (Assoc)
702 MAS (Assoc)
707 MAS (Assoc)
708 MAS (Assoc)
709 MAS (Assoc)
711 SOS (AFRES)
732 MAS (Assoc)
772 TAS
815 WRS (AFRES)
932 AAG (Assoc)
1400 MAS
Det 1, 1400 MAS
Det 2, 1400 MAS
Det 4, 1400 MAS
1401 MAS
Det 1, 1401 MAS
Det 2, 1401 MAS
Det 3, 1401 MAS
Det 4, 1401 MAS
Det 3, 1402 MAS

Excellence in Airmanship

Top Row—Left to Right
Capt. Jon M. Stolicny
TSgt. Richard W. Todd
Capt. Kevin G. Young
Capt. Arthur J. Cook

Bottom Row—Left to Right
Sgt. Ricky Christensen
SSgt. Richard M. Bressler
SSgt. Dennis C. Boyd
SSgt. Michael E. McFee

Capt. Jon M. Stolicny and Crew, 67 SOS, RAF Woodbridge, UK., were en route to Keflavik NAS, Iceland, 29 Dec 88, when Capt. Kevin G. Young, copilot, noticed the flight controls of their HC-130 binding. The yoke would not turn more than 5 degrees left of center. The engineer, TSgt. Richard W. Todd, and SSgt. Ricky D. Christensen, loadmaster, visually scanned the ailerons and flight controls but could not determine the problem. Ailerons would not deflect more than 1 inch. Consequently, the aircraft was slow to recover from right-hand turns and had limited left turn capabilities.

Captain Stolicny directed the copilot to declare an inflight emergency and coordinate for a controllability check. The radio operator, SSgt. Richard M. Bressler, after notifying the squadron of the problem and updating weather, informed Captain Stolicny that RAF Woodbridge weather was below minimums and Keflavik had strong, gusty winds. Captain Stolicny elected to divert to RAF Mildenhall because of its long runway and better weather. The navigator, Capt. Arthur J. Cook, provided initial headings to the airfield and briefed the crew on possible hazards. Because of the

possibility of flap/aileron binding, Captain Stolicny elected to perform a no-flap approach and landing. He requested a 25 nm localizer final approach and used only left-hand turns, fearing the binding would not allow the aircraft to roll out of a right hand turn. Captain Stolicny flew a flawless localizer approach and landed the aircraft in deteriorating weather conditions.

Captain Stolicny and crew demonstrated outstanding airmanship and crew coordination. Their actions prevented possible loss of life and aircraft. Their actions truly deserve the MAC Excellence in Airmanship Award. Well done from *TMF*.

Maj. Denver L. Pletcher and 1st Lt. Ray C. Schultz, Det 7, 37 ARRS, Minot AFB, ND., were conducting emergency procedure training in an HH-1H, on 17 Oct 1988. While performing a climbing left turn and passing 700 feet AGL, the aircraft lurched right, and the crew noticed a droop in rotor and engine RPM. In addition to the power loss, a loud grinding noise emanated from the transmission.

Major Pletcher, instructor pilot on the controls, turned the aircraft into the wind and lowered collective in an effort to regain rotor RPM. Lieutenant Schultz reconfirmed the emergency and identified obstacles that might prevent a forced landing. After establishing the aircraft in an autorotative descent and confirming the engine was still operating properly, Major Pletcher unsuccessfully attempted to regain powered flight by raising the collective—engine and rotor RPM again drooped and the grinding noise returned. Major Pletcher decided to continue the autorotation and perform a non-powered landing in an open field; he notified tower of the emergency and the proposed landing location.

By this time, the aircraft was down to appropriate flare height. Major Pletcher executed a flare, nearly zeroing forward airspeed and slowing the rate of descent to a level which allowed a smooth touchdown with minimal ground run and no aircraft damage. Once on the ground, Major Pletcher shut down the engine and Lieutenant Schultz immediately checked and determined there was no fire. The crew then notified the tower of their exact location and condition.

The crew had approximately 20 seconds to assess the situation and take appropriate action. Due to crew coordination and superior airmanship, Major Pletcher and Lieutenant Schultz recovered a valuable aircraft and averted a mishap. They well deserve the MAC Excellence in Airmanship Award. Congratulations from *TMF*. ✦

Left to Right: Maj. Denver L. Pletcher and 1st Lt. Ray C. Schultz

Severe Clear

Maybe the most hazardous weather after all.

FLIGHT HISTORY

It was a VMC day, the sun obscured by a thin overcast at 15,000 feet AGL. What a great day for flying. Skywest 1834 was inbound to Salt Lake City, Utah, after a flight from Pocatello, Idaho. Skywest 1834 was receiving radar vectors and traffic advisories from SLC TRACON. The Final controller advised 1834 to look for a Boeing 737 they were to follow to the airport; the traffic was "ten to nine o'clock, four miles, six thousand." Skywest, level at 7,000, reported traffic in sight and that they would follow the traffic. Ten seconds later the controller advised "1834, plan to follow that traffic, there's traffic south of him eleven o'clock, six miles north bound, seven thirty seven out of seven thousand five hundred, for the right." Flight 1834 began looking for the second Boeing. At 1251:02 MST, the controller gave another advisory of 10 o'clock, 4 miles and 7,400 feet. At 1251:15 the controller issued a left turn to 070 degrees to Flight 1834, which the crew acknowledged. At 1251:32 the controller transmitted: "Skywest eight thirty four, traffic's ten to eleven o'clock, three miles." Flight 1834 did not acknowledge the transmission, and at 1251:43, the controller told Skywest to turn left to zero five zero degrees. This call was answered and 1834 stated the traffic was not in sight. The controller gave a new heading of 360 degrees at 1251:50 which was acknowledged by the Skywest flight. At 1251:58 an expletive was transmitted over the TRACON final control frequency. There were no further transmissions from Flight 1834.

It was a great day to fly a practice instrument ride. The owner of a Mooney, a private pilot working toward an instrument rating, and his flight instructor prepared for departure. The UNICOM operator

at Salt Lake City Municipal 2 Airport stated that a Mooney, N6485U, had called to see if the runway was clear and was observed taking off around 1205 MST. The Mooney remained in the traffic pattern and made several touch-and-go landings. Recorded radar tracks indicated N6485U departed the SLC-2 traffic pattern at 1235, headed south, and maneuvered about 25 miles southeast of SLC before turning northwest. The radar track of 85U continued northwest until 9 miles south of SLC, where it began a gradual left turn until its target merged with the target of the Skywest flight at 1251:58. Some eyewitnesses stated that the nose of the Metro II pitched up just before collision. The collision occurred at 7,000 feet MSL in daylight visual meteorological conditions.

ANALYSIS

How can a midair occur in day VMC inside an airport radar service area (ARSA)? Sounds like it could never happen, but it did. The odds were stacked against the crew of Skywest 1834 and they didn't know it until seconds before impact. The commuter airliner was under IFR but flying in VMC; the Mooney was under visual flight rules, without Mode-C turned on. The Mooney was not in contact with any air traffic control facility, and although equipped with a strobe light, it was inoperative due to a defective transistor. The strobe's forward side was painted black to prevent pilot disorientation in flight, so even had the strobe been working, the pilots of Skywest 1834 might not have seen it. Weather was not a factor, but hazy skies and snow covered-terrain made locating other aircraft difficult for 1834's crew. See-and-avoid applied to both aircraft, even though Skywest was provided radar service. Pilots of both aircraft could have seen each other prior to the collision. The Metro II crew had about 14 seconds to see the Mooney; the instructor pilot in the Mooney had 27 seconds prior to impact to see the Metro II and take evasive action. Attention of the Skywest crew was focused in the direction of the airport, searching for traffic called out by the final controller, ten to eleven o'clock. The Mooney was in the two to three o'clock position relative to the Metro II. The Metro II pilot did see the Mooney and attempted to take evasive action, but not in time.

The final controller was unaware of the Mooney's intrusion into the ARSA. The radar data block of another aircraft covered the mark tracing movement of the non-Mode-C Mooney. In addition, controllers in TRACON are accustomed to seeing VFR aircraft in the pattern at Salt Lake City Municipal 2, which is less than two miles from the SLC International arrival path.

PROBABLE CAUSE

The National Transportation Safety Board (NTSB) concluded that the ability of pilots in either airplane to have seen each other in sufficient time to avoid collision was marginal. However, the instructor pilot in the Mooney had a better capability to see the Metro II and to avoid collision. The board also stated the Mooney's pilots had the responsibility to remain clear of the ARSA, and their failure to do so was a factor in the collision.

Investigation of ATC radar controller training revealed that formal training did not include ARSA or TCA intrusions by nonparticipating aircraft. The board further stated that the present ATC system is not adequate to assure collision protection between participating and nonparticipating aircraft in busy terminal areas.

APPLICATION TO MAC.

The majority of MAC pilots, by necessity, spend most of their flight time under instrument flight rules. The commuter pilots in this accident may have done the same. Obviously, being shepherded under radar control from takeoff to landing can lead to complacency and reduced vigilance. Air traffic controllers do a great job helping you avoid midairs, but the ultimate responsibility is yours. Don't forget it!

Adapted From *NTSB/AAR-88/03*

Flying-Hour Milestones

15,000

1 MAS
Lt. Col. Joseph C. Griffin

10,000

730 MAS
CMSgt. Calvin Gowens

7,500

23 AF
CMSgt. David F. Newell
SMSgt. Stephen Ciechanowski
MSgt. Thomas Aldrich

730 MAS
Col. Dennis W. Thompson

708 MAS
CMSgt. Ray A. Cooper
SMSgt. Willis E. Wellentin, Jr.
MSgt. Donald K. Horner
MSgt. Ralph G. North

5,000

23 AF
Lt. Col. Gerald K. Fennel
Lt. Col. Peter S. Marchewka
Maj. Barry B. Besold
Maj. Carl W. Henry
Capt. Hal B. Yarbrough
MSgt. Don C. Ford
MSgt. Matthew D. King
MSgt. Michael K. Rother
TSgt. Kenneth W. Miesner
TSgt. Michael Mulcahy
TSgt. Lewis D. Water

139 TAG
Maj. Truman D. Hardy
Maj. Peter L. Kehoe

730 MAS
Lt. Col. Terence M. Nelson
Lt. Col. Earl B. Stitt, III.
Maj. Robert V. Blanton
Maj. Ronald L. Fluitt
Maj. Kim Laronda

328 TAS
MSgt. John R. Barone
MSgt. Eugene H. Busch, Jr.

708 MAS
Capt. Hugh M. Smith
CMSgt. Magnus M. Wick
SMSgt. Paul N. Horine
MSgt. William E. Johns
MSgt. Galeard L. May
MSgt. Donn E. Sanchez
MSgt. Gary D. Yoder
SSgt. Alan P. Martino

129 ARRS
Lt. Col. Charles K. Cross
Lt. Col. Theodore R. Schindler, II.
Maj. Brian C. Haggerty
Maj. Philip N. Henry

2,500

9 MAS
Lt. Col. Robert L. Arguin
Lt. Col. Robert T. Dessert
Lt. Col. August I. Derosa
Lt. Col. George W. Findlay
Lt. Col. John A. Hinchey
Lt. Col. Michael G. Luckenbach
Lt. Col. Claude M. Phillips
Lt. Col. James F. Reichensperger
Maj. Warren L. Anderson
Maj. Thomas M. Cost
Maj. Charles L. Hudson
Maj. Robert M. Vanmeter
Capt. James A. Hickin
Capt. Raymond G. Torres
Capt. Julian E. Vazquez
Capt. Victor J. Ventrano
Capt. Rand A. Wickham
SMSgt. Johnny D. Hodges
SMSgt. Angel L. Martinez
SMSgt. Frederick L. Smith, Jr.
SMSgt. Robert B. Wayson
MSgt. Stephen M. Benham
MSgt. Judson L. Carnahan
MSgt. Charles B. Cloud
MSgt. Sherman M. Coppage
MSgt. Joseph J. Corning, Jr.
MSgt. Jose A. Costa
MSgt. Jeffery L. Davis
MSgt. Robert S. Dodd
MSgt. William L. Ellis
MSgt. Stephen A. Gresham
MSgt. Dale W. Hill
MSgt. Michael K. Kerwin
MSgt. Anthony O. C. Manson
MSgt. Michael A. Miller
MSgt. Michael E. Redmond
MSgt. Clifford A. Rumph
MSgt. Jerome C. Schnitzer
MSgt. Robert T. Shaughnessy
MSgt. Alton R. Sowersby
MSgt. David W. Yarrington
TSgt. Edward K. Bates
TSgt. Paul E. Bell
TSgt. Douglas J. Biffen
TSgt. Thomas R. Burns
TSgt. Jerry L. Cahela
TSgt. Michael A. Cox
TSgt. Craig A. Furr
TSgt. Larry D. Green
TSgt. Leslie A. Hoffman
TSgt. Kevin P. Kulig
TSgt. Jacob F. Lee, Jr.
TSgt. Larry B. Linaweaver
TSgt. Donnie T. Newsome
TSgt. Thomas F. O'Brien
TSgt. Paul M. Peterson
TSgt. Joseph P. Powell
TSgt. Delbert J. Summers, Jr.
TSgt. Paul G. Watson
SSgt. William J. Brennan
SSgt. Geoffery Campbell
SSgt. Donald A. Dufresne
SSgt. Vincent L. Giusto
SSgt. Richard S. Kinkade
SSgt. Everett V. Miller
SSgt. Richard J. Paris
SSgt. Kirk W. Schafer
SSgt. Henry G. S. Schierl
SSgt. Robert W. Stevenson
SSgt. Joseph M. Waddington
SSgt. Bradley F. Walton
SSgt. Sam Welcome
SSgt. Stanley J. Wilcox

18 MAS
Col. Edward M. Bullard
Lt. Col. George D. Schafer
Lt. Col. Quentin L. Peterson
Maj. Wayne W. Anderson
Maj. Mark S. Lavigne
Maj. John T. Lewis
Maj. Gregory A. Lokken

Maj. Everette B. Long, II.
Maj. Michael C. Strouse
Maj. Thomas J. Surlak
Capt. Kurt L. Baum
Capt. Alan E. Brennan
Capt. Thomas R. Kettler
Capt. Jerry D. King
Capt. Mark E. McCall
Capt. Richard S. Scherer
Capt. Peter L. Tarter
Capt. Michael L. Templeton
MSgt. Gerald C. Beard
MSgt. Von D. Cook
TSgt. Jerome C. Hanson
TSgt. Wilburn G. Lane
TSgt. Michael J. Morgan
SSgt. Michael F. Foley, Jr.
SSgt. Leroy A. McKenzie
SSgt. Nathan D. Sheets
SSgt. Joseph A. Watterson

23 AF
Maj. Randy P. Durham
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Ranks and units are those at time of award.

Battleline In The Cockpit

Untitled Manuscript

I make no claims for the truth of the story I'm about to relate; I don't know whether it's true or not. Worse still, I don't even know who wrote it. It simply appeared in my mailbox one morning—an old, battered yellow envelope, the stamps poorly printed and unreadable, the postmark too faint to make out. I'm equally in the dark as to why it was sent to me unless, possibly, the sender knew that I occasionally wrote stories for aviation magazines and wanted me to make his strange narrative public.

By Lt. Col. Clarence A. Carpenter
Det 54, 4 WG
September 1965

My name is Adam Cartwheel. I was copilot on MATS Flight 0057/32 which crashed at Downtown AFB. If you have seen the accident investigation report, you will have read the summary of the thorough, painstaking investigation leading to a very plausible conclusion as to the cause of the crash. With all due respect to the board and its very capable investigators, I must tell you they are wrong. I should like to give you the real story.

Let me begin by quoting a paragraph from the board's introduction: "After making a straight-in approach to land on Runway 06, in visual flight conditions, the aircraft continued to fly above the runway in a nose-up attitude but did not land. Near the departure end of the runway, from an altitude of approximately 100 feet, the aircraft nosed over sharply and dove into the ground. The aircraft was destroyed by impact and subsequent fire." All of this is fact. Most of the investigation details which follow are fact; only the conclusions are wrong. Let me show you how even highly capable investigators can be wrong about the cause of an airplane accident.

The report stated: "The crewmembers, an aircraft commander and first pilot, were current and qualified." This is true, but it does *not* state that the AC was having marriage trouble at home, that his wife was threatening to divorce him and take the children, and that he had just left an angry, tearful scene when he reported for

the flight that afternoon. It does *not* state that I, the copilot, was ripped with criticism and flayed with unmerciful sarcasm from the moment I reported (five minutes late) until we were airborne. It does not state that, by the time the wheels broke ground, I was angry and resentful; that I was bitter and rebellious against the frustrated, unhappy man in the seat beside me. I was so resentful by the time we took off I couldn't do anything right. I gave the AC the wrong frequency for our first en route VOR station, even though I knew the correct frequency as well as I knew my own name. At the first reporting point, I goofed up on a simple rate-time-distance problem and reported an impossibly short arrival time for the next reporting point.

"Congratulations, mister," the AC had said scathingly. "I'm glad to hear we're going to cruise at 1,200 knots in this bird, but I wish you'd have let me know we're now in a B-58. I didn't notice that when we left."

He gave the flight examiner standing behind us a look of disgust. I could have crawled under my seat, but the FE didn't seem too concerned about the matter. Guess he was used to dumb, young copilots.

We let the FE off at the first en route stop. The investigation report goes on to say: "The preparation for flight routine . . . " That's what they thought. By the time the major had finished chewing me out in the ACP (in front of the duty officer, navigator, and loadmaster), I had reached the point where I no longer cared about anything. As soon as we were alone in the men's room I popped my cork and told him I didn't have to put up with the kind of riding he'd been giving me. I'm afraid I said some things I shouldn't have. I told him I knew about his home troubles, (his wife had told a friend who had told my wife). I told him he'd been a pretty decent man to fly with up to now, but I was double damned if I'd have him taking his home problems out on me. I shut up only when the navigator came in, but more than enough had been said. We went through the motions of clearing the aircraft like two hostile warship captains forced to put up a front in a neutral port.

We made one more en route stop and then departed on the last leg. It was night now and we were cleared IFR to the terminal VOR, via flight plan route, to maintain 9,000 feet. After takeoff we were given radar vectors on course and were then released to Center's control. I say "we" but I should say "he" for the major had retreated into a cold, silent shell. He was no longer speaking to me. I took care of those few things which required no orders from him, but for the most part I might have been a passenger. The investigators, who couldn't know otherwise, described this last leg as, ". . . routine until the landing approach."

The report relates that the aircraft was handed off from Center to RAPCON and details the information about the receipt of altimeter settings and turnover to approach control for vector to the ILS approach course. It says "MATS 53124 was observed executing an approach from the ILS outer marker to Runway 06 and, after the passing the runway threshold approximately 70 feet above the ground, the aircraft flew over the runway in what appeared

to be a go around." It goes into some detail as to the engine sounds and it quotes witnesses regarding the position of the landing gear and attitude of the aircraft. This is all quite correct. The report also goes into great detail as to airspeeds, altitudes, and headings at various places during the approach; it analyzes the G-forces encountered—all this information from the flight recorder which was recovered "after approximately an hour and a half exposure to ground fire." The investigators draw some very scholarly conclusions from the attitudes, airspeeds, aircraft configuration, the marks made by the propellers on the ground, and so on. In fact, it's such a beautifully deduced conclusion, I almost hate to contradict it, but I must, for the benefit of future aircrews who may be flying with a battle line drawn the length of the cockpit.

The conclusion was there had been an undetected accretion of ice on the horizontal stabilizer and that when we tried to go around, probably because of an unsafe gear indication (and this probability is beautifully built up by an exhaustive analysis of parts found in the wreckage), the particular combination of airspeed, attitude, and ice caused loss of elevator control, sudden nose heaviness, and an uncontrolled dive into the ground. A fine piece of reasoning—but wrong.

I shall point out one more thing in the investigation report and then have to be done with it and tell you what actually happened.

Much was written about the information taken from the flight recorder. I will quote a few sentences. "A readout of the recorder tape revealed that, 20 minutes before the crash, there were nearly continuous variations of the G trace, ranging generally from a plus or minus .2G from the normal mean of 1G. These stopped a few minutes before the crash. The altitude trace showed a very rapid descent from flight level, and airspeed indicated an erratic decrease during this time. . . The attitude trace then showed a descent to about 70 feet above the runway threshold and the airspeed a decrease to 135 kts at that point."

Now that you have the background, do I really have to say what happened? There was an angry, worried pilot in the left seat and a disgusted, disheartened copilot in the right. The AC was handling everything himself—perhaps from spite, perhaps to emphasize how useless the copilot was. Maybe his desire to take his frustration out on something that couldn't talk back made him slam his aircraft down from en route altitude, haul the throttles back and ram them forward roughly in an effort to establish his maneuvering descent speed—made him spread himself too thinly among the exacting duties of flying the airplane, handling his own radios, and navigating.

Whatever the reasons, he was emotionally unfit to fly. The airplane got ahead of him yet he stubbornly continued his approach. The situation snowballed. Suddenly he found himself over the threshold 10 kts too fast. He hauled off the throttles and the gear warning sounded!

In disgust, he rammed the throttles forward for a go around, started his flaps up to takeoff position, and established a climb attitude, still disdaining the services of the extra baggage in the seat beside him who had the effrontery to talk back to a major with OVER TEN THOUSAND HOURS.

When the climb had been established, he leaned forward and sideways, reaching for the gear lever—which was still up. And that was when it happened! As he leaned forward, he momentarily allowed the yoke to go forward. I saw it instantly and, realizing how close we were to the ground, grabbed the wheel and forced it back to keep the aircraft climbing. The major gave me one furious glance in the darkness, put his right hand back on the wheel and shoved it forward roughly to put it back to where he thought he had left it. Unfortunately, I turned loose as soon as he put his right hand back on the wheel. The major's angry push was all it took. With the aircraft at slow speed and the flaps just starting to come up, it was at that critical point of balance every aircraft goes through just after takeoff. The angry push on the yoke nosed the airplane into the ground despite the major's last second heave of the wheel in an attempt to catch it. (Even this last second act, by the way, was deduced by the very thorough investigators. It was noted in the report that the nose was coming up when the aircraft struck.)

That's the story. Its lesson is obvious without preaching. You can see why I had to pass it on.

END OF UNTITLED MANUSCRIPT

And there you have the manuscript as I received it. It would not be so unusual, except for one fact in the first paragraph of the investigation report from which the writer has quoted so freely. I found it when I looked up the report. The first sentence of the first paragraph lists the flight number, the aircraft, and time and date of the crash. The second and last sentence I shall quote: "All the occupants, seven crewmembers and twenty-three passengers, received fatal injuries in the impact and subsequent fire."

FLYER CALL

As happened to seventeen Supervising Editors before me, it's time to put my last issue of *The MAC Flyer* to bed and turn over the reins to someone else. It's one of those sad/happy occasions we all face in life. Sad because over the last three and one half plus years, *TMF* became almost like another appendage, always with me wherever I was, no matter what I was doing. It's also a happy occasion, because *TMF* needs periodic infusions of new ideas and fresh outlooks to keep it alive and interesting. New people can now put their own perspectives on answers to the question: What can we say that MAC crewmembers will want to read, remember, and take to heart?

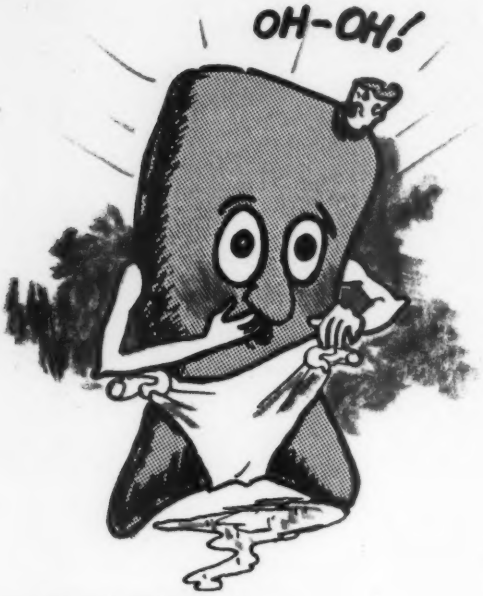
That's the real reason *The MAC Flyer* exists; to keep MAC crewmembers aware of factors capable of destroying their chances of safely completing their mission. MAC crewmembers have a tough mission, and they perform it well. Our safety record proves that, but we haven't been able to completely eliminate mishaps. We did in 1988, but 1989 isn't proving as good a year. Why? Because we're human, and humans make mistakes. That's why we at *TMF* have concentrated on human factors so much in the recent past. MAC crewmembers are well trained and know how to do their jobs right. Most of our recent mishaps occurred when somebody didn't do the job right. How can we prevent the same thing from happening again? Education—examining the factors and causes of each mishap so crewmembers, young and not-so-young, can learn, take heed, and not fall into the same traps. That's why *TMF* has been around for 35 years, and hopefully will be around as long as there's a Military Airlift Command and United States Air Force.

The MAC Flyer is your magazine. I hope it served you well while I had a part in it. My sentiments on leaving echo those of former editors I've spoken with: "It was the best job I ever had."

See you on the line.

TCW

QUICKSTOPPERS



BLADDER PROBLEMS
(August 1980)

There was no way to purge the two 50,000-gallon-capacity fuel bladders at the exercise site, so they were flushed out with water and left to vent for 24 hours prior to being rolled up. Unfortunately, it was raining when the bladders were rolled and placed in plywood boxes lined with plastic bags.

After crating was complete, the boxes were left out in the rain. Next, the containers were shipped out on a C-130 as general cargo with no paperwork describing what was really inside. During climbout, the residual fuel inside the bladders seeped out of the containers and quickly filled the airplane with noxious and very combustible fumes. The Herk crew wisely went on oxygen and diverted to a nearby airfield for a safe recovery.

JP-4 and water don't mix, so flushing the fuel bladders with H_2O was only a partial solution to the problem, and one which should have definitely been identified to the crew along with a properly completed Dash-2. Leaving the bladders out in the rain so water could get inside was a little different from an oversight—it was downright fatuous.

OVERHEARD ON THE FLIGHT DECK
(June 1976)

Clipper One had just landed and was taxiing toward the terminal. Quantas 434 was lining up in preparation for takeoff.

Clipper One: "Tower, this is Clipper One. We'd like to report a turtle on the runway just this side of the second taxiway."

Tower: "Roger Clipper One. Is it stationary or moving?"

Clipper One: "Oh, he's mobile—moving right to left."

Tower: "Can you give me an estimate on when he'll be clear?"

Clipper One: "Oh, he's pretty close to the edge and doing about point zero two knots."

Tower: "Quantas 434, did you copy?"

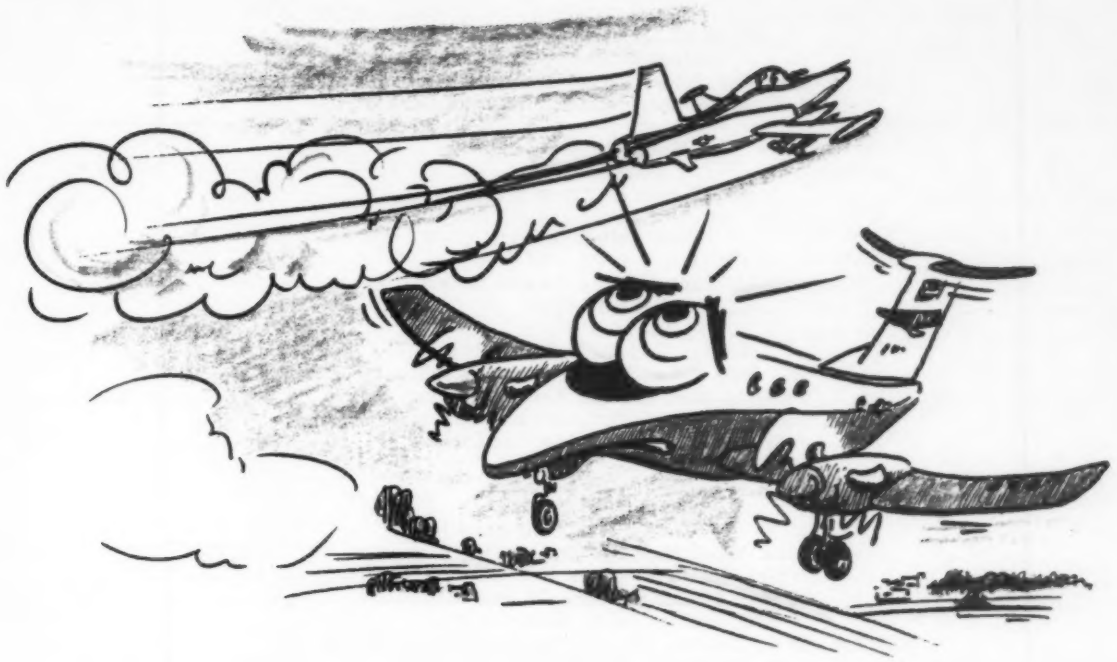
Quantas 434: "Quantas 434, affirmative."

Tower: "Do you wish to delay takeoff for traffic to clear?"

Quantas 434: "No, thanks. We'll go around him."

Tower: "Roger. Quantas 434 is cleared for takeoff. Beware wake turbulence. Departing turtle."

CELEBRATING 35 YEARS OF *TMF*: 1954 - 1989



A C-12 was cleared by Osan Approach Control and given climbout instructions toward its Pacific island paradise destination. While passing FL 160, the Super King Air crew swallowed their Adam's Apples and observed an F-5 in their 10 o'clock, level. Another "Killer Talon" appeared to pass 1,000 ft directly in front; and still a third "white rocket look-alike" passed 500 ft behind them. By this time, evasive actions would have been *TOO* late, and none were accomplished.

There you have it, another potential disaster averted through the wonders of the "Big Sky" theory. But what went wrong? What didn't work? What can we fix?

The answers to these questions are quite perplexing: nothing, NOTHING, *NOTHING*!!! Approach control tapes indicate Osan advised the MAC twin-spinner of "Traffic 9 o'clock, 6 miles, type and altitude unknown." Shortly after, Osan issued "Previous traffic indicates 2,000 ft unverified." One minute later, the excitement occurred.

The F-5s involved were VFR and not in radio contact with Osan Approach. (Read this part very carefully.)—THERE IS NO POSITIVE CONTROL AIRSPACE IN KOREA AS IN CONUS. VFR traffic is allowed at all altitudes and further complicated by a limited number of ATC facilities to track air traffic. DOD FLIP states that a "see and avoid" concept *must* be adhered to in Korea.

In other words, HEADS UP & OUT FLYING applies there more than ever. If you thought there were simple solutions—forget it. But remember, this environment is a snap compared to what you'll find in a war zone. Furthermore, not all fighters flying near you will be friendly. Compound this airspace struggle with the fact you'll also compete with artillery and high altitude bombing.

So here's the real answer, train like you'll fight. To die in a midair with another friendly, after you've accomplished a difficult and dangerous combat mission, would be a real bummer. So start training yourself *now* to visually clear the airspace you're about to use.

HQ MAC Staff Directory

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(IG)4445/4446/3947/3958
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Col. Ronald B. Dorcy, Deputy Inspector General

Directorate of Safety
(IGF)3528/2003
Col. Thomas M. James, Director
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Safety Education and Awards Division
(IGFE)3534/5542
The MAC Flyer
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Flight Safety Division
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(IGFX)5543
Mr. Larry K. Wolfe, Chief
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Autovon: 576 + Extension
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After Deadlines

REGRETS TO THE 463d TAW--We inadvertently misidentified the 463d TAW as the 463d MAW on the cover of our May 1989 issue. We sincerely regret any distress this may have caused.

RAMSTEIN AIRCREW WINS BIG-- Capt. Theodore E. Hartenstein and crew, 58 MAS, Ramstein AB, West Germany, received the 1988 Lt. Gen. William Tunner Award. Captain Hartenstein and his crew's selection is a result of their heroic rescue efforts during the air show tragedy, in Ramstein, August 1988. Initially assigned for security support, the H1 helicopter aircrew responded by using their rotor wash to suppress the flames. The crew then landed in the midst of the wreckage and began to evacuate the injured. Good show!

ANG UNIT IS FIRST TO RECEIVE THE C-26A--The 147th FIG, Ellington AFB, Texas, received the first of 10 C-26A turboprops from Fairchild Aircraft Corporation. Delivery of the remaining nine is expected in November 1989. The C-26As replace the Guard's C-131s used for operational support.

WE ASKED YOU TO TOP IT AND YOU DID!-- A West Virginia ANG crew with a total of 74,519,3 hours flight time and 171 years, 11 months and 5 days on flight status, is the latest unit claiming the honor. Pictured below, from left to right, first row, are: Col. Jack D. Koch; Lt. Col. Edwin B. Kuempel,; Col. Dell R. Wightman. Second row: CMSgt. Gary D. Albright; SMSgt. Raymond T. Boarman; and CMSgt. David H. Frazier.

☆ U.S. Government Printing Office: 1989—654-015/8

U.S. AIR FORCE